Space Weather Forecast

Issued on Monday, 06 May 2024 at 01:24 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate-class flares likely with a chance of Strong flares through the period. Minor-Moderate Geomagnetic storm conditions are possible on day 1 (6 May) given potential CME influence, with a slight chance of an isolated Strong Storm interval. Lowering chance of further geomagnetic activity days 2 and 3 (7-8 May).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity reached High levels following two Strong flares at 05/0601 UTC and 05/1154 UTC from the large and complex sunspot in the northwest, with numerous other Moderate flares from this region. The other large and complex sunspot in the southeast also contributed an Moderate flare at 05/0938 UTC.

There are currently nine sunspot regions on the visible disc. Aside from the active spot groups mentioned, a much smaller and simpler sunspot group in the southeast showed some slight growth and was numbered. The remaining sunspots on the disc are generally small, stable or in slight decay, and magnetically simple.

No obvious Earth directed CMEs have been observed, however updated coronagraph imagery is currently unavailable or very limited, therefore confidence is lower than normal.

Solar Wind / Geomagnetic Activity: Solar winds were at background levels but with a gentle rising trend in the UTC evening. The Interplanetary Magnetic Field displayed similar trends with a recent Moderate peak. The important north-south component varied weakly then transitioned into a sustained Moderate southward orientation during the UTC evening. These parameters likely indicate some CME influence. Resultant Geomagnetic activity was predominantly Quiet (Kp 1-2), becoming Unsettled to Active (Kp 3-4) 05/1800-2359 UTC, as measured by BGS. Lerwick observatory recorded a G3/Strong Storm interval (Kp 7) just prior to midnight UTC.

Energetic Particles / Solar Radiation: Solar radiation was at normal background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast to continue with further Moderate-flares expected and a chance of isolated Strong flares, principally from the large sunspot regions located in the northwest and southeast disc.

Solar Wind / Geomagnetic Activity: Three Earth-directed CMEs currently feature in the forecast period. The first may yet provide a glancing impact early day 1 (06 May) although as a diminished possibility. The second a potentially more significant CME associated with the 03 May Strong flare may also interact with Earth during day 1 (06 May), with the third possibly giving a glancing blow late day 1/early day 2 (6 to 7 May).

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Some coronal hole influence is also expected into days 1 and 2 (06-07 May) and could see speeds peak at elevated levels before slowly declining although CME influence may mask this signal.

Combining possible effects from the various CMEs and coronal hole influences through the period results in a lower than average Geomagnetic forecast confidence.

Geomagnetic activity is expected to increase on day 1 (06 May), becoming Unsettled to Active with some G1/Minor Storm intervals possible, and a slight chance of isolated G2/Moderate to G3/Strong Storm conditions. Activity should generally subside through days 2-4 (07 to 09 May) to mostly Quiet conditions by the end of the period. Any glancing pass from 4 May CME could give a slight chance of reaching G1 levels late day 1/early day 2 (06 and 07 May).

Aurora Forecast: Combined coronal hole and CME effects are likely in the next day or so, increasing the chance of enhanced auroral activity. Aurora may be visible during the limited hours of darkness in parts of Scotland and Northern Ireland and perhaps visible across parts of northern England and North Wales where skies remain clear. Activity is most likely to be greatest Sunday into Monday, although timings of peak activity will be highly dependent on the arrival times of any enhancements.

Energetic Particles / Solar Radiation: Solar radiation levels is most likely to remain at background levels through the period. There is a slight chance for an S1/Minor Storm or greater event occurring throughout however, primarily from the large, complex sunspot region in the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	20	5	1
Strong	G3	No	20	1	1	1
Severe	G4	No	5	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	90	90	90	90
Very Active	R3 to R5 X	Yes	25	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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